

Vadnais Lake Area Water Management Organization

## 2021 Water Monitoring Summary



### **VLAWMO's monitoring program consists of:**

- 15 Lakes: *Grab samples*
- Lambert Creek: *Grab samples, remote sensors*
- Water quality sampling every other week from May to September:  
*Dissolved oxygen, conductivity, chlorophyll-A, chloride, phosphorus, nitrates, total suspended solids, turbidity, temperature, bacteria, pH, and storm sampling*



See the complete report at [www.VLAWMO.org/resources/reports](http://www.VLAWMO.org/resources/reports)

# The Watershed at a Glance

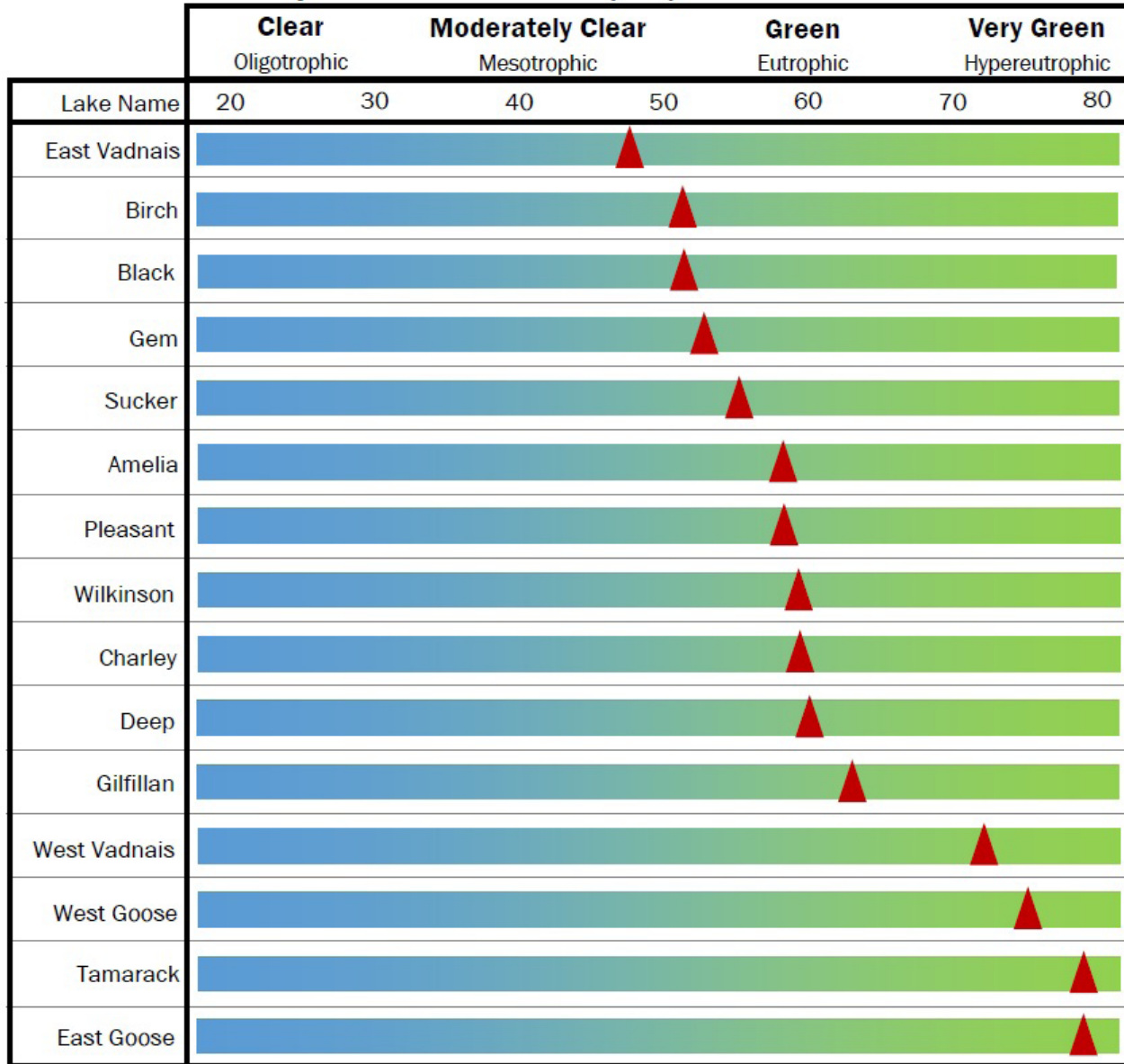
See the 2021 water monitoring report at [vlawmo.org/reports](http://vlawmo.org/reports) for more information.



## Thinking like a lake scientist:

Lake science is a continual quest for data, trends, and critical thinking. Lakes can vary from year to year depending on what's happening either within or around the lake. Sometimes trends aren't visible to the naked eye. Because of this, lake scientists take a long-term approach and piece together multiple variables to draw conclusions.

### Trophic State Indexes (TSI) of VLAWMO Lakes: 2021



## Definitions:

**TSI:** Trophic Status Index. The trophic status of a lake pertains to its nutrient levels, transparency, and chlorophyll. The data for each reading is combined to create a single value, which is a TSI index, depicted with red arrows.

**Oligotrophic:** Low nutrient levels and abundant oxygen. May be suitable as an unfiltered water supply.

**Mesotrophic:** A moderate amount of dissolved nutrients. Iron or manganese taste/odors, turbidity increases.

**Eutrophic:** Rich in nutrients, supporting either a dense plant population or large algae blooms.

*Eutrophication is the process of nutrient loading into a waterbody from the surrounding watershed (i.e. upland area). It is a natural process that can be accelerated by stormwater runoff and erosion.*

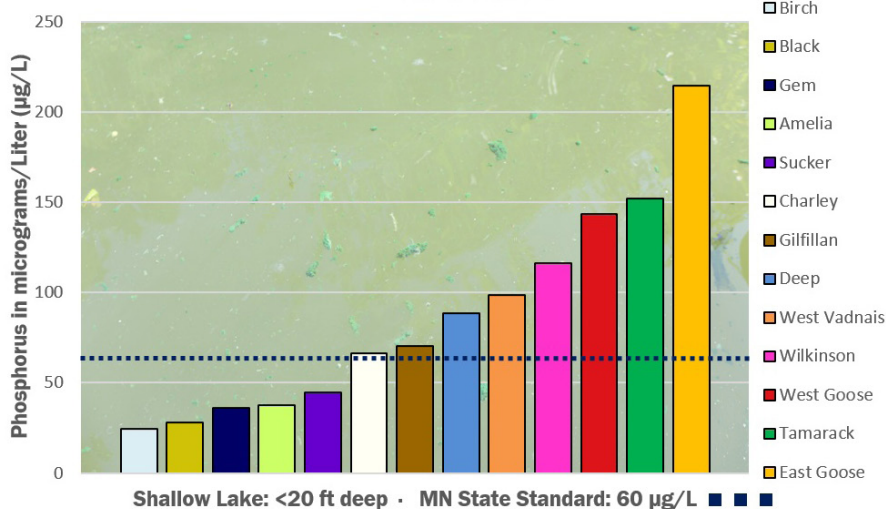
**Hypereutrophic:** Exceptionally high nutrients causing dense algae and macrophytes. Rough fish (bullhead, carp) dominate, blue-green algae most likely, fish kills possible during algae blooms. Episodes of severe taste and odor.

# Nutrients and Chlorides

Visit [vlawmo.org/waterbodies](http://vlawmo.org/waterbodies) for specific lake studies, reports, and lake fact sheets.



**Average Total Phosphorus of VLAWMO Shallow Lakes:  
2010-2021**



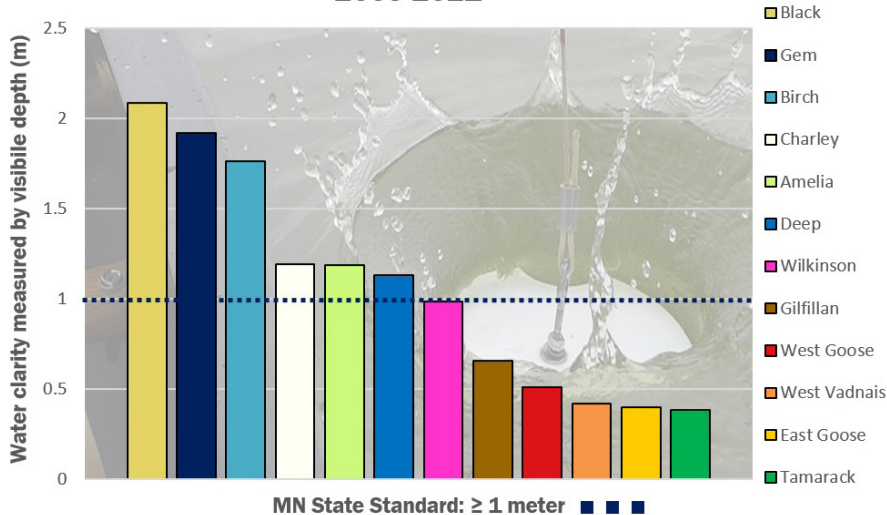
## Phosphorus: What is it?

Phosphorus is a naturally occurring nutrient and a main driver of algae growth. 1 lb. of phosphorus can produce up to 500 lbs. of algae. Increased algae levels create low oxygen, poor light penetration, and reduced fish and wildlife habitat.

### What it means to me:

High phosphorus levels determine whether the water looks like pea soup or an aquarium. Excessive algae can produce foul smells and toxins harmful to humans and pets. To control this, it's important to keep sediment and nutrients on the landscape and out of waterbodies.

**Average Secchi Disk of VLAWMO Shallow Lakes:  
2009-2021**



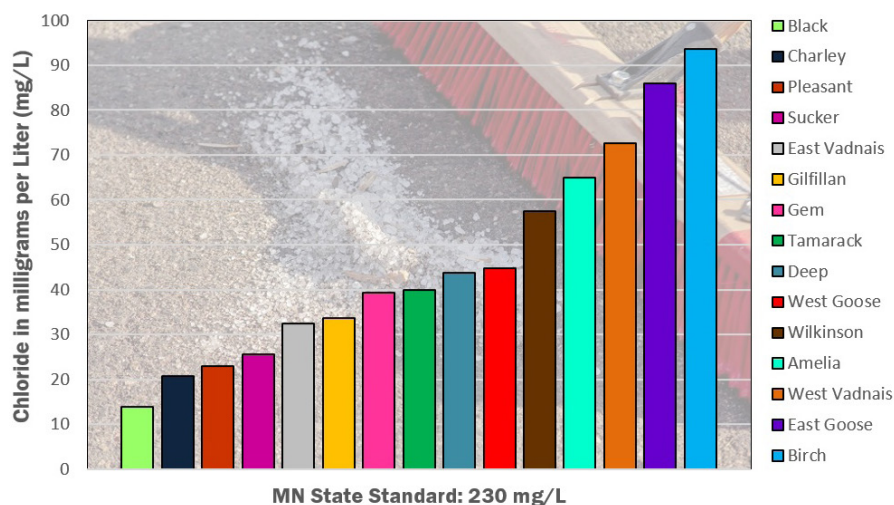
## Secchi Disk: What is it?

A Secchi disk is a 20 cm disk that is lowered into the water until it can no longer be seen by the observer. This depth of disappearance, called the Secchi depth, is a measure of the transparency of the water.

### What it means to me:

Transparency is the most basic indicator to assess risks for almost any lake use, and informs what to be aware of downstream. Poor transparency means there's something extra in the water that needs to be looked at. Transparency can be affected by pollutants or sediment draining into the lake, or by existing sediments from the lake bottom re-circulating into the water.

**Average Chloride Levels of VLAWMO Lakes:  
2010-2021**



## Chloride: What is it?

Chloride is a common ingredient in salt de-icers and home water softening. Chloride is a permanent pollutant to water quality, requiring only 1 tsp to pollute 5 gallons of water. It is toxic to aquatic life and interrupts lake temperature and nutrient cycles.

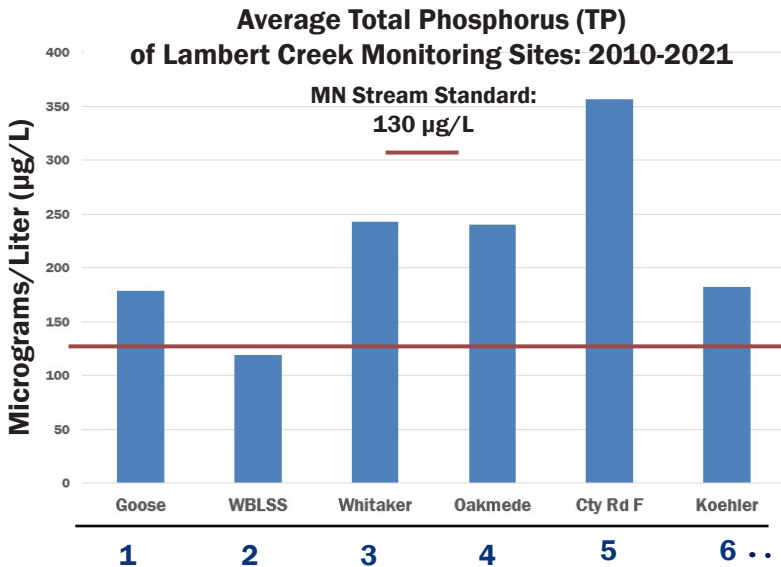
### What it means to me:

Chloride poses threats to freshwater and even drinking water supplies, because there is no economical way to remove it. VLAWMO currently has no waterbodies impaired for chloride, but some lakes show upward trends. Lake chloride levels can decline as water flushes through, but that chloride will be present wherever the water goes.



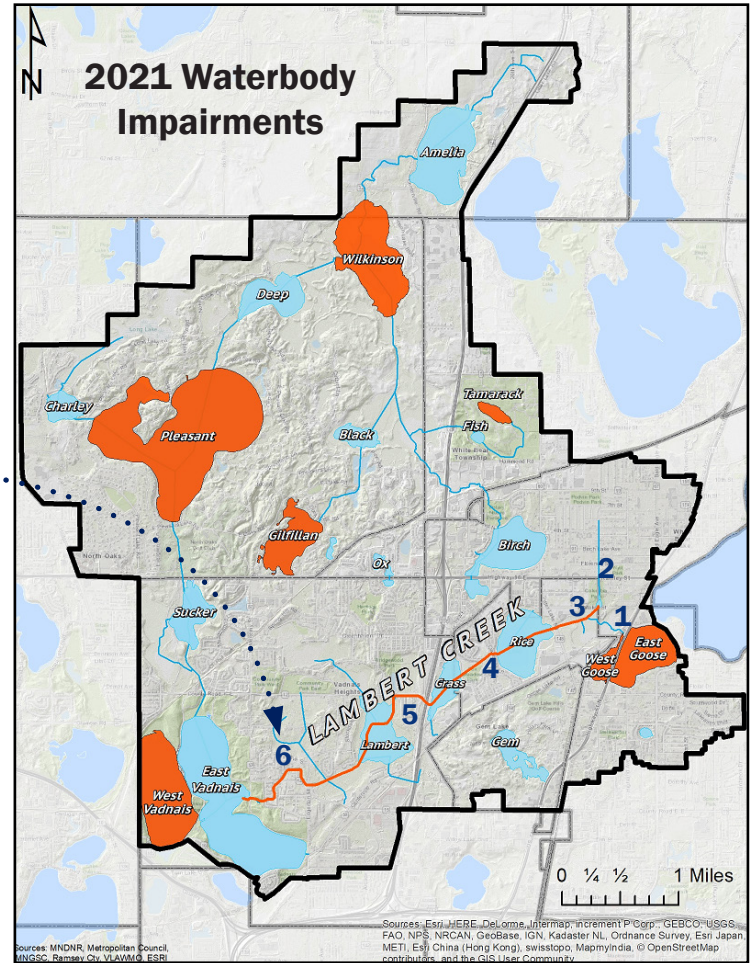
Visit [VLAWMO.org/residents](http://VLAWMO.org/residents) to learn how you can help take care of the watershed from home.

## Lambert Creek:



Lambert Creek is impaired for high bacteria during storm events, and although not officially impaired for nutrients, the creek monitoring results show high nutrient levels. Water samples from six sites are taken along the creek every other week from May to September (locations on map, right). E. coli bacteria has been detected as largely avian and canine.

**Waterbody impairments:** VLAWMO has several lakes listed as impaired waterbodies. For a lake to be listed as impaired, it must show a trend in being above standards for several years. Impairments can be assigned for nutrient levels, bacteria, chloride, or others. VLAWMO's lakes are classified as shallow, but Pleasant and East Vadnais are classified as deep.



## Citizen Science

### Aquatic Invasive Species:

VLAWMO partners with Ramsey County Soil and Water Conservation Division to monitor for new infestations of aquatic invasive species. In this program, trained volunteers gather aquatic vegetation samples throughout the growing season. This provides the opportunity for early detection before infestations become problematic or spread to other lakes.

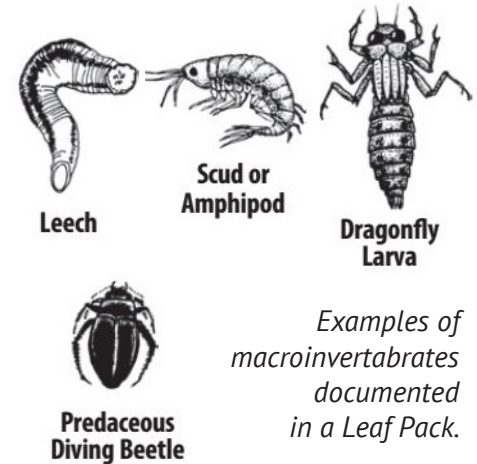
### Macroinvertebrates:

To compliment chemistry monitoring, VLAWMO utilizes bio-monitoring to gauge what's living in lakes or streams. This data provides a long-term snapshot of the water's health, because different organisms favor certain water quality and habitat conditions. Based on what we find in our samples, we gain clues about what's happening in the aquatic habitat over time and through the seasons.

This effort is supported by volunteers using the Leaf Pack program. In 2021, four locations were monitored along Lambert Creek in addition to the Charley and Deep Lake channels. Visit [vlawmo.org/get-involved](http://vlawmo.org/get-involved) to learn how to be involved with this exciting citizen science program.



Above: An aquatic vegetation sample taken at Birch Lake.



Right: A VLAWMO volunteer analyzes a Leaf Pack from Lambert Creek.

